

Intersection of Medicine and Literature

by

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Chapter I

Prolegomena

"The art of medicine is a crucible, into which go and out of which come the mixtures that make life."¹

Medicine and art, especially literature, have often intersected. Whether writers have taken the information which medical sciences provided to build literary characters or to place their action in hospital environments, doctors such as Wilhelm Moehsen, Jean-Paul Marat, Robert Liston, Richard Gordon, Oliver Wendell Holmes and many others have chosen to write literature. In the past, doctors had to have the widest possible culture, to know Greek and Latin and to have knowledge of philosophy, psychology and art. Medical training was not limited to the strict knowledge of exact sciences such as chemistry, physics and anatomy. The social, moral and ethical dimension of the medical profession is closely linked to literature and art in its broader sense.

In the context of the contemporary world, these two fields continue to be complementary: as literature tends to become more abstract and to reach generally human truths, medicine retains its tangible character, working with particularities. If literature idealizes mental and physical suffering, medicine must understand and find a cure for them. However, medicine is radically different from other sciences because it does not simply summarize itself with an accumulation of data, but interprets it, gives it meaning and finds a practical way to reach a solution. Intuition plays an important role in medicine because

¹ Sherwin B. Nuland, *Prooemium. An introduction to my book, The Uncertain Art: Thoughts on a Life in Medicine*, The Random House Publishing Group, 2008, p. XIX

in addition to an interpretation of facts, the doctor is faced with difficulties that involve people and their fate. Instinctive penetration into the essence of the disease presupposes feelings and emotional involvement without which a correct diagnosis cannot be made.

Physicians therefore use both rational intelligence supported by the development that has taken place in other sciences, as well as emotional intelligence in order to create a viable image of the patient and the disease. Nowadays we are aware that this permanent dialogue between medicine and literature must be encouraged. There are doctors who have used writing to start the fight against certain systems: health, politics or medical education. The mutual influence that the two, the art of healing and that of writing, manifest on each other is indissoluble. Far from being on opposite positions, the two influence each other. The communication of points of view and the debate have formed the essence of literature throughout the centuries. Contemporary medicine, in the era of globalization and the acceptance of the cultural diversity that characterizes us, is beginning to understand the need for this dialogue. Both have something to gain from the efforts of the other. The two complement each other and can help each other by further broadening the closeness between people.

Understanding the cultural context and moral values is necessary for medicine to be as efficient as possible. The human being and his pathology cannot be separated from the broader context of the society in which he lives. Furthermore, society has certain cultural and moral values to which it relates. The scientific aspect of technology development, so important in medicine, would be impractical if we did not relate to the final recipient: the human being. No matter how much technology we develop, it would be useless if it did not permanently relate to spirituality and specifically human needs.

Literature can only be beneficial to the medical practitioner because it helps him to better understand human nature, with its weaknesses, fears and needs. What medicine brings to this process of mutual influence is the objectification of these needs, bringing them from the abstract to the concrete and palpable plan of the suffering individual. Doctors must understand how the patient can react to their pathology and literature offers enough examples of characters whose relationship to themselves and to others can facilitate this cognitive process that the therapist must go through. The human being is not just an accumulation of biological processes and a well-developed anatomical system. The penetration of general human truths, of what unites us as disparate individuals but also of what makes us unique represent the goals of literature and the desiderata of medicine. Awareness of one's own personality, probing one's own abysses and understanding the mechanisms by which man has survived on a psychic and spiritual level begins to leave its mark on medical sciences as well. Literature brings with it and supports critical thinking, or in modern society in which more and more aspects of professional ethics and morality arise, this penetrating judgment whose weapons are provided by the art of writing can only be beneficial. Although philosophy represented frontier science, currently writers are the ones who examine and probe the tension of the human soul, the antagonism that marks it, and the anguish that can take possession of it. All these consolidate the discoveries that medicine has made over time.

Literature is closely linked to the evolution of human society and, throughout history, has been one of the aesthetic values that has most accurately reflected the cultural, political, economic and intellectual progress of humanity. The art of writing has tried to answer the most burning questions that man has raised, proving to be an aesthetic value with a purpose, not infrequently useful. Medicine, on the other

hand, started from the need to offer survival solutions. In essence, even if the two fields seem incongruous, they only serve man in his primordial needs. The connection between the two is similar to that between the mind and the body. In modern society, the relationship between the two is increasingly recognized, reaching the point where some medical faculties teach border sciences because both must benefit from the other. The humanities can help the individual understand the needs and patterns of human behavior, as well as the differences that make us unique. On the other hand, the humanities also benefit from the experience accumulated by medicine through its daily practice.

Aesthetic values make a great contribution to understanding man in new ways. Beyond what makes us unique compared to others, there are characteristics common to all of us. Literature identifies archetypes, providing models that we can analyze and, by extrapolation, use in analyzing a personality. In turn, literature benefits greatly from new discoveries in medicine, borrowing concepts that human healing should take advantage of. When doctors decide to test their literary abilities, there can only be a positive result. In the not-too-distant future, when each field of knowledge encounters others, there will be contamination and mutual influence. And storytelling, as a form of human expression, is one of the ways of communication. Doctors should be much more open to this form of expression of spirituality. Patients talk about their pathology and “tell themselves”. A good listener can elucidate the mysteries behind the words. The story of the one in suffering is, after all, a form of literature even if the declared purpose is not to become an aesthetic value but only to transmit information. The doctor, as a listener to the life story of the sufferer, is the pre-reader. Medicine and literature intercondition at a much deeper level than we would think. Poetry, as

a much more analytical language, can develop abstraction skills in the medical practitioner who decides to express himself lyrically.

Some exegetes² consider that poetry, as a form of manifestation of literary sensitivity, can shelter scientists but not vice versa. A possible explanation lies in the very profession of doctors. They perceive the human being as a grain of existence and do not allow themselves to be carried away by the exaltation of writers. And, then, what drives these rational spirits into the realm of literature? Perhaps the need to enter communion with those around them because, medical science, although it deals with man, does so only in a quantifiable and objective manner. No matter how much detachment such a professional would try to achieve, the need for spiritual closeness persists. And this directing of the imagination specific to man towards literature is more a physiological need of the servants of Aesculap to be understood. If we were to borrow the term that biologist Peter Medawar proposed in his book, *The Art of the soluble* (1967), art is the science of the insoluble.

Medawar, himself a scientist, best describes the relationship between the two. Science focuses on those questions that can be answered while art focuses on those human inquiries that are still waiting to be answered. Science is humanity's response to intrinsic and practical needs for a better life, and literature is spirituality's response to spiritual needs. Both use fantasy but in different ways: "Poets, more than scientists, tend to sing the plenitude of existence, but science, surely, is also potentially filled with that refrain. An attunement

² Robert Crawford, *Rampage, or Science in Poetry*, in *Contemporary Poetry and Contemporary Science*, Oxford University Press, 2006, p. 11

between the plenitude of revelatory science and the exfoliatory plenitude of poetry is called for.”³

Historically speaking, scientists and writers have viewed each other with distrust, even suspicion, as C.P. Snow observed.⁴ The two social categories, doctors and writers, constituted the intellectual elite of each society. Both guilds disputed their primacy on the stage of the society and, for quite a long time, they perceived each other as opponents. In the second part of the 20th century, the two fields understood that, beyond what differentiates them, the ultimate goal is the understanding of the human being and that, despite the inherent differences, they should open themselves to each other. R.S. Downie⁵ identifies four ways in which the two intersected.

The first and most obvious way is that many doctors have chosen to write literature. A second way in which the two fields have come to influence each other is in modern society. More and more films are placed in medical settings and have as protagonists servants of Hippocrates because the viewer's need for drama but also empathy is thus satisfied. A third way in which literature can bring progress is that many of the literary characters doctors have been painted in gloomy or even sarcastic colors. Knowing how their profession is viewed by those they are supposed to serve can only be a benefit for the future doctor. Devoid of the arrogance specific to his studies, the medical practitioner is brought among the others by the satire of which he can be the subject. A fourth way in which, this time, medicine directly benefits from literature is through a better understanding of the human being and, therefore, a more efficient

³ Idem, p. 62

⁴ C. P. Snow, *The Two Cultures*, in *Leonardo*, Vol. 23, No. 2/3, New Foundations: Classroom Lessons in Art/Science/Technology for the 1990s. (1990), pp. 169-173

⁵ R S Downie, *Literature and medicine*, in *Journal of Medical Ethics*, 1991 Jun; 17(2): pp. 93-98

approach through the development of a constructive dialogue in the doctor-patient relationship.

The present paper is an attempt to connect the study of literature with medicine, complementing the research to date with a new perspective on how the medical studies of the authors analyzed left their mark on their literary creation but also on how the literary work of some servants of Aesculap was influenced by their scientific studies. The last century represented a breaking of the barriers between academic fields, allowing the penetration of some neophytes into the field of artistic creation. Our study, without being exhaustive, is a presentation of the personalities who managed to combine the art of healing with that of writing or who chose to live their spiritual sensitivity through literature. The present work aims to argue that the two fields: medicine and literature are complementary, both confident in human value.

Chapter II

Physicians and the Renaissance

Physicians have been not only professionals in healing but also, by the nature of their studies, initiators or supporters of culture. One such example is **Gerolamo Cardano** (1501-1576) who, beyond his status as a doctor, was a prominent scholar of the Renaissance. Cardano studied both the exact sciences (mathematics, chemistry, physics, astrology, biology) and the humanities (philosophy, literature and medicine). The Italian-born doctor links his name to the inventions of binomial coefficients, the movement of hypocycloids - later used for the movement of the printing press, but also to numerous inventions such as the padlock, the cardan joint, the rotation transmission mechanism. In algebra, he was the first European to use negative numbers.

Cardano's philosophical works include: *De arcanis aeternitatis*, *De consolation* (1543); *De sapientia* (1544), *De animi immortalitate* (1545); *De subtilitate*, *Theonoston* (publicată abia în 1617 și 1663), *De utilitate ex adversis capienda* (1561), *Encomium Neronis*, *De uno*, *Tetim seu de humana conditione*, *De minimis et propinquis*, *De summo bono* și *Guglielmus, sive de morte* (1562), *Antigorgias dialogus sive de recta vivendi ratione*, *Hyperchen* și *De Socratis studio* (oublicate în 1566), *Proxenetes, seu de prudentia civili* (1627), *Paralipomena*. In 1666 Charles Spon published other discovered works of Cardano: *Hymnus, seu canticum ad Deum*, *Mnemosynon*, *Norma vitae consarcinata*, *De optimo vitae genere*, *Dialogus Hieronymi Cardani et Facii Cardani ipsius patris*, *De natura liber unicus*.

What is defining for Cardano's philosophical system is a mixture of mystical beliefs, Aristotelianism, Platonism, Arabic philosophy,

religious beliefs, numerology and even occultism. All of this tends to recreate a unitary structure of the way in which the author perceives reality as an interaction between nature and soul, the cognitive function that is the only one able to quantify reality and human knowledge but also the indestructible relationship between man and the cosmos. Pessimistic by nature, Cardano intuited that the only enemy of man is himself through his cowardice and the fear that he lets dominate him. For the mathematician and physician, the soul and the body are two separate entities. The human soul does not die with the physical one but is integrated into a collective entity *anima mundi*. This universal energy takes the corporeal form of animals (as primitive forms of existence) and of man. Man exists between the uniqueness of God and the multitude of life forms. Man perceives as aesthetically beautiful what is, in fact, organized matter characterized by proportionality.

He inherited his gift for mathematics from his father, Fazio Cardano, a mathematician and jurist. Although his health was poor as a child, Cardano survived and ended up studying at the University of Pavia. Due to the political context that led to the temporary closure of the university, Cardano continued his studies in Padua. Although he had brilliant intelligence, after completing his medical studies, he was forced to practice medicine in a rural area. Ambition took him to Milan where he ended up teaching mathematics but did not neglect his medical duties, quickly becoming known to influential circles. A convinced humanist, Cardano was one of the first doctors to understand that if a patient was mute, this did not damage cognitive function. Despite this disability, mute people can learn, Cardano believed. In 1570 he was arrested by the Inquisition but spent only a few months in prison. In Rome, however, he continued his medical and writing activities. The personality of this doctor remains astonishing even today because his writings and inventions have

repercussions up to our days: “His writings contain rudiments and ideas pertaining to almost every scientific and philosophical doctrine developed during the seventeenth century.”¹

To better understand the immense impact that the Italian physician had, we must look at the culture of his society as a whole. Born and prolific in the midst of the Renaissance, Cardano, along with Galileo, would influence subsequent generations of thinkers, astronomers, and mathematicians. A new era would be built on the edifice of thought built by this physician: the Enlightenment. It was a period of transformation, of transition from the fabulous, the supernatural, and heresies to sciences based on rationalism. And Cardano made an important contribution to this transition in both astronomy and literature, from philosophy to medicine.

The Renaissance was based on ancient values, looked to the past for answers, and systematically rejected science. However, it brought eclecticism. Most scholars specialized in several fields. To be considered valuable, the Renaissance scholar must touch on several fields of study. Even the sciences abounded more in empiricism than in the identification of clear reasoning. Pseudosciences invade the horizon, and many create an amalgam between true scientific precepts and mysticism. This was the cultural context in which Cardano professed and studied. The merit of this scholar is that he intuited the need to develop a more judicious organization of knowledge: “he was striving for a philosophy that would embrace the amazing multiplicity of phenomena and organize them into a meaningful whole. (...) his scientific work is a means of understanding the world

¹ Markus Fierz, *Girolamo Cardano: 1501–1576 Physician, Natural Philosopher, Mathematician, Astrologer, and Interpreter of dreams*, Translated by Helga Niman, Boston, Basel, Stuttgart, Birkhäuser, 1983, p. XII

and human nature in general, as well as a way of gaining self-knowledge.”²

In 1545 Cardano published *Ars Magna*, the book that propelled him onto the intellectual scene and brought him recognition for his encyclopedic spirit for revolutionizing algebra. Like most of his existence that was strewn with aversion in intellectual circles, this treatise on algebra also opened a dispute with the mathematician and engineer Niccolò Tartaglia. Five years later, in 1550, Cardano came up with another landmark work: *De subtilitate*. The book was highly criticized by Julius Caesar Scaliger (1484-1558). But this did not harm Cardano's fame because Scaliger was known for his furious attacks on several respectable authors. Although it has a didactic substratum, containing experiments and inventions of the author, the tone of this work is a ludic one in which the author even inserted anecdotes. In Italy this book was not well received by the Catholic church but in 1556 it was translated into French and circulated among the population which proves the impact it had on the middle classes of society. In 1557 parts of this work were printed under the title *De Rerum Varietate*. This time the Inquisition banned the book. In 1663 Cardano, eager to offer readers a more comprehensive book that would encompass all human knowledge up to that point, published *Opera Omnia*.

The entire life of this distinguished polymath was strewn with humiliations. From the moment of his birth as a bastard, to the poverty and illnesses he endured in his youth, to the struggle to establish himself in the medical profession where he was forbidden to enter due to his humble origins, to the numerous detractors who envied his intellectual and professional abilities, to the humiliation of seeing his son condemned to death, to the hostile actions of the Inquisition that

² Idem, p. XXI

threw him into prison and forced him to renounce many of his works. Cardano's genius consisted in intuiting a system that would correlate the disparate facts of human knowledge. Cardano was a die-hard gambler and tried to apply mathematical principles in order to win at dice or other games of chance. The doctor believed that there were certain qualities that some people could use to predict or create. This principle that could bring benefits in the act of creation or in medicine was defined by Cardano as *cognition corporea*.³

Understanding this necessity represented the next step and the Enlightenment leap. The physician-philosopher understood both human and cosmic nature as a rational system. The only path, which Cardano considered viable in understanding phenomena, was reason. Cardano was a pioneer of the sciences in a world still suffocated by mysticism. Let us not forget that, at an advanced age, at seventy-five years old, he wrote *De Vita Propria Liber*, a story of his own life. The book attracts with its satirical tone, its ability to describe itself with such mastery and even lack of vanity. Written at a brisk pace, this autobiography does not lack self-irony even as the author describes himself: "I am a man of medium height; my feet are short, wide near the toes, and rather too high at the heels, so that I can scarcely find well-fitting shoes (...) My chest is somewhat narrow and my arms slender. The thickly fashioned right hand has dangling fingers, so that chiromantists have declared me a rustic. (...) My left hand, on the contrary, is truly beautiful with long, tapering, well-formed fingers and shining nails. A neck a little long and inclined to be thin, cleft chin, full pendulous lower lip, and eyes that are very small and apparently half-closed (...)"⁴ This detailed description of his own body, beyond

³ A se vedea Manfred Zollinger, *Random Riches: Gambling Past & Present*, Routledge, Taylor & Francis Group, 2016, p.82

⁴ Jerome Cardan, *The Book of My Life (De Vita Propria Liber)*, Translated from the Latin by Jean Stoner, E. P. Dutton & Co., Inc., New York, 1930, p. 19

the slight mockery, hides the doctor accustomed to seeing the details that could reveal the nature and diseases of the patient. Professional distortion, perhaps, the self-portrait that Cardano paints for us cannot but arouse a small smile in the reader. His objective nature could not be too indulgent even with his own person.

The same habit of analyzing every symptom of illness, a habit acquired during his time as a physician, can be intuited from the lines dedicated to his state of health. With the meticulousness of impartiality, Cardano lists all the ailments he suffers from without the shamelessness that would overwhelm other writers: "My head is afflicted with congenital discharges coming at times from the stomach, at times from the chest, to such an extent that even when I consider myself in the best of health, I suffer with a cough and hoarseness. (...) Another trouble was a catarrh or rheum of the teeth. (...) Now I have fourteen good teeth. (...) Indigestion, moreover, and a stomach not any too strong were my lot. (...) In my youth I was troubled with congenital palpitation (...) I had hemorrhoids and the gout (...) I ignored a rupture."⁵ Also in this part of the autobiography we learn about other illnesses that the scientist endured: insomnia, malaria, plague, dysuria, vertigo, suicidal tendencies. The study of his own illnesses helped him better understand those in suffering and allowed him to have empathy for his patients.

In a later chapter, like a true dietician, Cardano explains what he eats in great detail, concluding his plea for a cleaner life with a classification of spices with curative effects, foods to avoid, and types of exercise that anyone who wants to be in better health should do. Again, Cardano emphasizes reason, the only one meant to provide solutions: "without this illuminating logic, certain things, which are

⁵ Jerome Cardan, *The Book of My Life (De Vita Propria Liber)*, Translated from the Latin by Jean Stoner, E. P. Dutton & Co., Inc., New York, 1930, pp. 21-22

actually most clear, would seem not quite so evident to you!"⁶ The doctor seems willing through the autobiographical lines to share everything with the one who reads his paper, and this stylistic device brings with it an increased degree of intimacy. We discover in the lines of this book not only a scientist, a medical professional but also a talented writer, a fine psychologist who understands that by making the reader a participant in his life, by bringing him closer.

This represents not only a writing stratagem but is proof of an extraordinary narrative talent. With a simple language and a relaxed attitude, Cardano transforms each of us into confidantes and this is the rare gift given to great writers. Even moral self-characterization does not escape the author's pen. With the same detachment and lack of vanity, Cardano describes himself as a difficult personality, choleric, hasty, vindictive, egocentric and given to the pleasures of life, for in his youth we learn that he liked betting. However, he also finds some qualities of which to be proud: "a truthful man; I am mindful of benefits conferred, attached to my own people, a lover of justice, and a contemner of money. (...) By nature I am prone to every vice and every evil save ambition. (...) I have such a quick temper that I am often shamed and embarrassed thereby. (...) frequently make rush decisions."⁷ Cardano firmly believes that by acknowledging one's weaknesses and the defects that one has come to understand, one is closer to self-improvement. Hiding weaknesses only poisons the soul, the author concludes, while open confession can only be praised.

We understand even better the humanism that animated the polymath when we read his confession: "From my early youth I persistently held to this purpose-that I should make it my duty to care

⁶ Idem, p. 31

⁷ Idem, pp. 50-51

for human life. The study of medicine seemed to point more clearly to such a career. (...) I deemed medicine a profession of sincerer character than law, and a pursuit relying rather upon reason and nature's everlasting law, than upon the opinions of men."⁸ Given the years he has dedicated to healing, Cardano has some advice in this area as well. One of the most important is that the doctor should put aside his own pride and put the patient's interest first: where a treatment proves useless, the applicable principle is that of efficiency: "In caring for the sick you should never regard action as second to efficacy (...) I pay tribute to experience rather than to my own wisdom or to any over-confidence in my own skill. (...) I have always maintained, all remedies should be suitable."⁹ A rare thing in that era when the pride of the medical profession was more important than the sufferer and often, Cardano's colleagues sacrificed the lives of patients just to not give up on their own ideas.

With an unusual meticulousness and writing flair, Cardano explains all the events of his life, organizing them into categories. The book is also sprinkled with descriptions of rarer cases of illness that he treated. The author is not ashamed to declare his professional incapacity in the case of three patients who died. Like most scholars of the time, Cardano also proves to be attracted to the occult: the premonitory dreams he had, the abilities of clairvoyance and guardian angels. But one of the principles on which he based his entire system of thought, and which should be mentioned is that of meditation on the world: "a contemplation of the natural universe leads to an artistic expression and to creative labor."¹⁰ This demonstrates that, for the mathematician-physician, all the elements

⁸ Jerome Cardan, *The Book of My Life (De Vita Propria Liber)*, Translated from the Latin by Jean Stoner, E. P. Dutton & Co., Inc., New York, 1930, pp. 39-40

⁹ Idem, p. 83

¹⁰ Idem, p. 217

of life are connected: science contains art and vice versa. The two are not exclusive but complement each other.

We even discover verses written by Cardano, (*A lament on the death of my son*) a poem that bears the imprint of the suffering of having lost his son. It is about one of the two sons who was sentenced to death, Giambattista, as a result of the alleged involvement in the murder of his wife. Cardano firmly believed that this had been a plot hatched to denigrate him. His pain is often felt in the autobiographical page. Of rare beauty both lyrically and through the sentiments they reveal, Cardano's verses also qualify him as a poet:

Who has snatched thee away from me —
 O, my son, my sweetest son?
 Who had the power to bring to my age
 Sorrows more than I can count?
 Wrath in whose soul or what stern fate
 Willed to reap thy youth's fair flower?
 Not Calliope, not Apollo,

Served thee in thine hour of need!
 Cithara, now, and all song be still;
 Measures of threnodies shall renew
 Mourning and sighs for my dear son.
 —Strains of his singing haunt me still —
 Laurels, alas, in the healing art,
 Knowledge of things, and a facile gift
 Of Latin tongue — what profit these
 Labors long if they swiftly die?
 Service rendered Spanish prince,
 Duty done to the noblest of men
 Help thee naught if with these for thy judge
 Death with his scythe doth seek thy blood.

What, ah me, shall I do? My soul
 Swoons to remember thee, gentle son;
 Silent, I brood on thy destiny grim;
 Tears that I dare not give to words,
 Shall I not shed for my stricken son?
 Lasting encomium had I reserved,
 Fitting reward to thine ashes paid;
 Silence—O shame—must my tongue now guard,
 Death unjust nor its cause announce.
 Grave are the ills thou hast borne, mild son.
 Prince and Senate and ancient law
 Ordered thy doom whilst thou in rash haste,
 Brought an adultress the wage of her crime.
 Safely adultery now in our homes
 Mocks and insults when punishment swift
 Stays the avenging right hand of the youth.

.....
 Wife of a memory blessed and true,
 Happy thy death, nor spared for this grief!
 I, through this crime, have myself brought disgrace,
 O son to our name, for by envy compelled,
 Homeland and Lares paternal I left.
 Death had I sought for my innocent soul,

But surviving and living I vanquished my fate.¹¹

How bitter it must have been for a father to have to endure the loss of
 his son! How much anguish must Cardano have felt, having to go
 through the greatest evil that can befall a father's shoulders, burdened
 by years: to outlive his son!

¹¹ Jerome Cardan, *The Book of My Life (De Vita Propria Liber)*, Translated from the Latin by Jean Stoner, E. P. Dutton & Co., Inc., New York, 1930, pp. 271-273

Cardano's genius is a good example of the capacity to serve man both as a writer and as a physician. His scientific and literary writings would pave the way for other personalities. His merit is that he understood that medicine is only part of a much more comprehensive whole in which the polymath included mathematics, occultism, astronomy, and even literature.

The Renaissance representative **Andreas Libavius** (1550-1616) first taught history, philosophy and lyric poetry at the University of Jena before turning to medicine at the University of Basel. Libavius continued to practice medicine, becoming, in 1591, physician of the city of Rothenburg. In 1606, he retired to Coburg, where he headed the local high school. Although his origins were modest, Libavius was a convinced autodidact. Interested in alchemy, like most scientists of the time, the German doctor signed an encyclopedic work in 1597: *Alchemia*. In the treatise, Libavius reviews almost all the discoveries made up to him. His interest in chemistry did not remain only theoretical, as the doctor conducted experiments, including those on the preparation of hydrochloric acid, ammonium sulfate and tin chloride.

Adherent to Aristotelian principles, Libavius did not limit himself to applied sciences. His intellectual interests also included logic, physics, pharmacy, theology and, last but not least, lyric poetry. This inclination towards literature was all the more pronounced since he had taught poetry courses. Between 1599 and 1601, the doctor wrote four volumes dedicated to medical sciences (*Singularia*) and in 1610 published one of the first medical treatises in his country-of-origin *Tractatus Medicus Physicus und Historia des fürtrefflichen Casimirianischen SawerBrunnen/unter Libenstein/ nicht fern von Schmalkalden gelegen*.

Alchemy was a field that combined practical experiments, philosophical meditations, the study of religious texts and vast scientific knowledge. It was the moment in which various personalities asserted themselves: from the Italian Renaissance Giovanni Pico della Mirandola (1463-1494), to the pioneer of the revolution in medicine-the Swiss Paracelsus (1493-1541) to Robert Boyle, followed by the one who laid the foundations of classical mechanics-the mathematician Isaac Newton (1642-1726). Boyle's merit in this context of alchemy is that he tried to give credibility to this science, leaving aside the occult practices that prevented it from being understood by many scholars. Boyle intuited the need for medicine to be based on laboratory experiments, quantifiable and repeatable that would establish certain norms. This intellectual work, of removing alchemy from the controversial light of metaphysics, of entering it into a new, much more solid realm, was accomplished with difficulty and, unfortunately, was perceived by many as an offense. Libavius had to carry out a sustained work of transforming alchemy into a practical science and he encountered opposition from his confreres.

One of these open conflicts was with the Jesuit Jacob Gretser and Johannes Hartmann. Basically it was a struggle between the old and the new. The old doctrines of Paracelsus supported by mysticism and religious radicalism had no applicability in the light of new discoveries. This was the cultural context in which Libavius published *Alchemia*. The author structured his treatise very well, in four parts. The way in which scientific problems are treated is very logical and the text illustrates "a transitional phase of chemical science."¹² The term alchemy that Libavius used referred to what we call chemistry today. The author considered that *encheria* dealt with chemical methods of preparation, *chymia* with the substances themselves, and

¹² Henry M. Leicester, Herbert S. Klickstein, *A Source Book in Chemistry, 1400-1900*, Harvard University Press, 1952, p. 21

magisteria dealt with the existence of qualities (hidden or visible) in chemical substances.

Libavius's combative spirit has been considered by some exegetes as a value in itself, perceiving the books signed by the doctor "equally valuable as grammatical exercises, dialectical demonstrations, and moral sermons (...) joining language, virtue and institutional authority in defense of academic wisdom."¹³ This ability to support his ideas in an argumentative, coherent and even literary style came from the period of his studies in which he had learned Latin, Greek, grammar, rhetoric. The tone of his writings is pedagogical and dialectical. His unbeatable logic, in which knowledge is based on physical truths, found its best partisan in Livarius. The doctor's dissatisfaction with the followers of Paracelsus also came from the encryption they used. An adherent of concise but clear expression, Libavius believed that the basis of understanding scientific phenomena lies in adequate vocabulary. For him, the model of elegance was Horace's *Ars Poetica*. He created from his polemic "a didactic tool, transmuting apology into pedagogy and turning discussions of alchemy and medicine into moral, logical, and rhetorical lessons."¹⁴ Libavius brought language into the vocabulary of chemistry and medicine, he used the pen with great skill in the fight against the sclerotic forms of science of his time. And this combination of literary and rhetorical abilities and science is unique in the landscape of medicine. His scientific merit is that of having opened, in the field of chemistry, the path to constructive discussions, using his abilities as a Latinist and orator. His intellectual ideal was a clear language that would make chemistry a coherent science, open to everyone. But doctor Libavius also wrote poetry. In *Missilia*

¹³ Ole Pterre Grell, *Paracelsus. The Man and His Reputation, His Ideas and Their Transformation*, Brill, 1998, p. 136

¹⁴ Idem, p. 149

Clarissimorum Virorum Et Amicorum. In Lauream Poeticam Huldrichi Buchneri (published in Jena in 1597), the doctor appears as the author of three poems.

Jan Jesensky (Johannes Jessenius) (1566-1621) came from a family of Polish nobles who had gained their freedom by an imperial decree in 1562. In the early part of his life, the doctor had been raised in the spirit of German Protestantism, but later, following his studies in various countries, this influence would be a humanist revival one. Jessenius is a representative figure of the European Renaissance.

Jessenius was born in Wrocław (Poland) and studied philosophy and medicine in Wittenberg, Leipzig (Germany). In Leipzig, he studied and lived in the house of the anatomist Georg Walther, where he also performed vivisections. In 1587, he completed his philosophical studies with the dissertation *De animae humanae immortalitate*. He then left for Padua, where he studied under the renowned Girolamo Fabrizio d'Acquapendente or Hieronymus Fabricius (1537-1619). The latter, an illustrious anatomist, linked his name to the discovery of venous valves, which was to be the first step towards the theory of blood circulation of which William Harvey was the author. Fabricius had opened in Padua the *Theatrum Anatomicum* (1594), a hall in which dissections were performed and which allowed the general public to attend in order to learn.

The Polish physician-polymath's system of thought was eclectic. Like his studies, the conception of life and evolution that Jessenius propagated was one at the crossroads of faith in Lutheranism, Renaissanceism, medical sciences and philosophy. The vast readings helped Jessenius to make references to Plato, Aristotle and even religious texts in his works. His cultural ideal was a reconciliation of the sciences with philosophy. To consider them distinct branches of human knowledge was equivalent to a disservice to both. A work

from 1591 signed by him, *De divina humanaque philosophia, progymnasma peripatheticum*, has the value of a manifesto of his beliefs. In this text, Jessenius interweaves religious and philosophical beliefs in an attempt to answer the question of the origin of life. In the same year he signed *Provindiciis contra tyrannos*. The work would not be printed until 1614 but it was an act of courage due to the broad political views it promoted. Aware that a world of dictators could not last long and familiar with the political writings of Aristotle, Jessenius advocated in this text for equality between rulers and subjects. It is not so much about equality but about equity on both sides of the political barricade. The author advocated the necessity of popular revolt in the event that this “contract” was violated by politicians. In other words, the people have the right to sanction those leaders who do them harm. This demonstrates the broad views of this Renaissance man, well ahead of the ideals of the French Revolution.

Professionally, Jessenius began his ascension by practicing medicine in Wroclaw, then in Dresden where he became a physician at the court of Saxony. In 1593, Jessenius published *Zoroaster, Nova, brevis veraque de universo Philosophia*, having as its central theme what for the physician represented an important aspect: the understanding of the universe through the prism of philosophy. The following year, 1594, brought him the appointment as professor of surgery and then as professor of anatomy. The Saxon period of this polymath's life represented the peak of his medical and cultural career. Arriving in Prague for more political reasons and in search of fame beyond the German borders, Jessenius brought to public attention a dissection lesson held in Reckova. Success in important circles was not long in coming. Back in Germany, the doctor published a work (*Iohannis Jessenii a Essen, Anatomiae, Pragae, Anno M.D.C. abs se solenniter administratae historia*) describing the dissection in Prague. In addition to the political dedication that he made in the case of all his works,

Anatomiae, Praegae ended with verses written by the doctor Jessenius himself. The work is a treatise on internal organs, but what is new is the description of their physiology as well as detailed descriptions of the sense organs. Some critics credit Jessenius with being the one who made the work, *Nova de Universis philosophia*, belonging to another scholar - Franciscus Patricius, known in Germany.¹⁵

Surgery was his favorite in the field of medical sciences and, in 1601, Jessenius published another paper (*Institutiones chirurgicae quibus universa manu medendi ratio ostenditur*) in which he defended this science from pseudo-surgeons. Considering that the art of surgery cannot be practiced and mastered by everyone, the author claims a special status for it. The perspective that Jessenius brings is a completely innovative one. For this enthusiast of the study of anatomy, surgery was the next and natural step of putting it to the service of humanity through its practical benefits. And we are referring here to major surgery, which is all the more special in those times. Surgeons, according to the author, must not be limited to minor surgery but must have the courage to perform important operations on internal organs or to remove congenital defects or tumors. The following years will perfect him both in the art of surgery and in the handling of an increasing number of surgical instruments. The doctor also attaches great importance to semiology, because the correct diagnosis of certain diseases also brings with it the finding of the appropriate cure. In other words, Jessenius perceived medicine not as a science with separate fields but as a system of scientific knowledge in which each element from anatomical parts, physiology, semiology,

¹⁵ See Patrizi and *Natural Philosophy: The Zoroaster by Johannes Jessenius*, in *Fruits of Migration: Heterodox Italian Migrants and Central European Culture. 1550-1620*, Edited by Cornel Zwiwerlein and Vincenzo Lavenia, Brill, Leiden, Boston, 2018, p. 63

to surgery, come to complement each other. This integrative vision is certainly that of a humanist.

In 1602, back in Prague, Jessenius dissected the corpse of his brother-in-law who had died of typhus. The disease was wreaking havoc among the German military. The cultural and professional climate of Prague suited the doctor so he decided to settle there. In 1606, following a new plague epidemic, Jessenius published his annotations on this scourge in the work *De cavenda tollendaque peste consilium*. What this treatise brings new is the scientific perspective. Let us not forget that, desperate for the ravages that this disease had been wreaking for more than two hundred years, Europeans were trying to find explanations: from the ethnicity of the sick, to divine punishment or climate change.

Jessenius made the correlation between proper hygiene and the decrease in the number of illnesses, which led, consequently, to the conclusion that this disease was a communicable one. At the same time, the doctor insisted on a varied diet, the use of spices, and optimal hydration. Jessenius also studied the composition of the blood and stated that venesection was not a safe practice because it could increase the patient's weakness. This conclusion would arouse opposition from his confreres who appealed to venesection as a last chance for recovery. Like most people of culture of the time, Jessenius wrote texts related to the medicine he practiced, treatises on communicable diseases and surgery, but also works of a philosophical and even lyrical nature. He held the position of rector of two universities: that of Wittenberg and that of Prague.

Starting with 1608, there followed a period of travel through several European states and the publication of a historical work dedicated to the Hungarian monarchs *Regis Ungariae, Mathiae II. Coronatio* (1609). As a physician to King Mathis, Jessenius accompanied his patron but

also began his work as a historian, writing *Ad divum Matthiam Caesarem*. In 1617, he decided to settle in Prague as rector of the university there. His political involvement increased and in 1618 he was present at meetings of representatives of the Czech states in Karlovy Vary. Ferdinand II arrested him and brought him to Vienna where he remained in prison for several months before being released. In 1620, he was arrested again, this time convicted of *Crimen laesae majestatis*. The sentence was particularly cruel: cutting out the tongue while alive, beheading, and tearing the body into four pieces.

Understanding the need for knowledge not only cultural but also in relation to the human body itself, Jessenius published a work *Anatomiae, Pragrae* (1601) dedicated to the dissection of the human body. The purpose of the text was not only purely scientific information, but much broader. Jessenius used this opportunity to create a form of publicity for his guild but also to bring anatomical knowledge of the body closer to the common man. In addition to the detailed description, as much as the state of knowledge of the time allowed, Jessenius made this text one of rare culture through references to classical authors. Thus, his text proves to be a link between the art of dissection and culture. A supplement to this work appeared in the same year under the title *De ossibus tractatus*. Although this period of the Renaissance was still dominated by mysticism, the vast majority of scholars sensed the need for scientific principles on which to base the study of medicine.

From a medical point of view, the Renaissance was based on the teachings of the ancients. Writings in the field from that period are very numerous. Our chapter has focused, although not exhaustively, on some personalities of medicine who also had literary inspiration. The most important characteristic of the period is the discussion of the separation of medicine from other arts but also from other sciences

among them so that a specialization of each field could be made. The fact that people of culture realized the need for these delimitations was a preliminary step in identifying distinct areas of scientific research, each with a set of rules applicable separately. At the same time, the question of separating medicine from the humanities arose.¹⁶

This period of intellectual effervescence is characterized by the oscillation of scholars between knowledge based on philosophy or natural phenomena on the one hand and religious knowledge, revealed through mystical intuition. Physicians played a special role in this era of transition. They were the spearhead of change because they sensed the need for objective demonstrations, impartial research, highlighting the weaknesses of certain theories and, in general, the argumentative support of points of view. Being, along with monks, almost the only ones who were open to culture, physicians were those intellectuals who understood the value of literature as a means of disseminating information. The secularization of medical sciences was only the first stage of the social and cultural evolution that was to come in the following centuries. Whether they wrote purely scientific texts or created literary texts, physicians were an important source of Renaissance writings.

¹⁶ Winfried Schleiner, *Ethics: Some Preliminary Reflections in Medical Ethics in the Renaissance*, Georgetown university Press, Washinton D.C., 1995, p. 2

Chapter III

Physicians and the Enlightenment

The spread of science, culture and high values regarding human beings took place between the 17th and 19th centuries. New discoveries in numerous fields, liberation from the tutelage of religious dogmatism, the aspirations of people of culture for a world centered on the values, ideals and aspirations of the human being made this period favorable for change. The astronomer, mathematician, physician and writer **Nicolaus Copernicus** (1473-1543) was the one who initiated the scientific revolution. In turn, this led to the spread of innovative ideas that represented the ideological core of the Enlightenment. Doctors in these times of cultural revival focused their work on the interests of the patient. At the same time, it is the era in which it becomes a desire for people to gain access to more and more information, in which the role of personal and public hygiene for improving living conditions begins to be intuited. Considering human nature perfectible, the Enlightenment opened the way for progress and medicine becomes a science *per se*, which takes its civilizing role seriously. In this era of great transformations, the role of physicians becomes increasingly complex because they are the ones who, having knowledge, will also have the task of spreading culture.

The founder of modern chemistry and philosophical writer **Robert Boyle** (1627-1691) benefited from refined education, studying Latin, Greek and French. Boyle was, as some exegetes characterize him, “a shadowy figure, a fledgling experimentalist working first in moral philosophy and then in natural philosophy, actively seeking a theory